DOOSAN

Optimal Solutions for the Future

Mynx series

Heavy Duty Vertical Machining Center

Mynx series

Mynx 5400
Mynx 6500
Mynx 7500

ver. EN 160122 SU

Mynx series

The Mynx Series provides various spindle motor options, selectable to suit customer requirements. The high speed cam type automatic tool changer achieves high productivity. In addition, the large workpiece capacity and convenient operator software package make the Mynx the ideal solution for a wide variety of applications.

Contents

High Rigidity

Arch type column structure designed with FEM to minimize deformation during heavy duty machining guarantees excellent durability and stable accuracy under heavy load.

High Productivity

Users can select spindles of various driving systems and specifications according to the workpiece material to achieve higher productivity.

Enhanced Convenience

We offer a wide range of peripheral device solutions that can be optimized to suit customer's specific needs. Also easy operation packages(E.O.P) have been customized to provide fast and easy setup of tooling, workpiece, and program.

Basic Structure

High-rigidity machine structure provides high durability and stable accuracy during heavy duty cutting.

High-rigidity Machine Structure

Design with arch type column structure to minimize deformation during heavy duty cutting, the Mynx series provides excellent cutting performance and stable accuracy. In addition, the bed, column and other core parts are designed with Finite Element Method (FEM) taking dynamic and static rigidity into consideration to implement excellent vibration resistance and long-term durability.

Arch type column structure :
Mynx 5400/6500

High-rigidity Design

A solid machine structure is realized through 3D computer simulation.

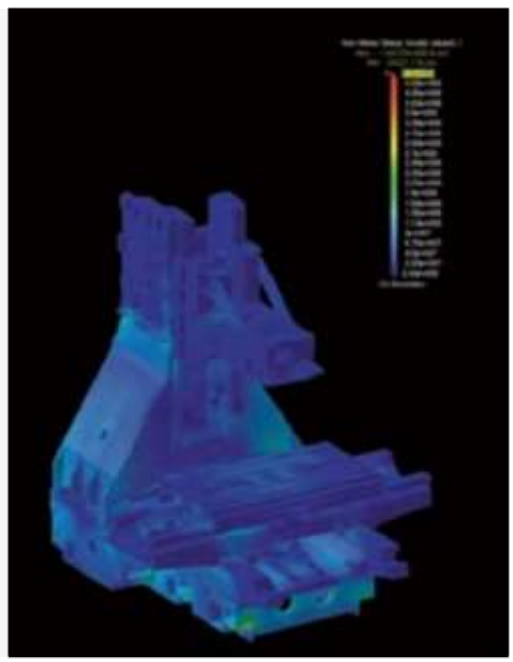
Dynamic rigidity

Frequency response and vibration absorbability are improved with stable structure. Natural frequency performance is increased by 30% compared to the previous models.

Static rigidity

The highly rigid body of the Mynx Series designed with FEM increased the static rigidity by 30% compared to the previous model.

※ Finite Element Method (FEM) analysis is used to design an exceptionally stable body.

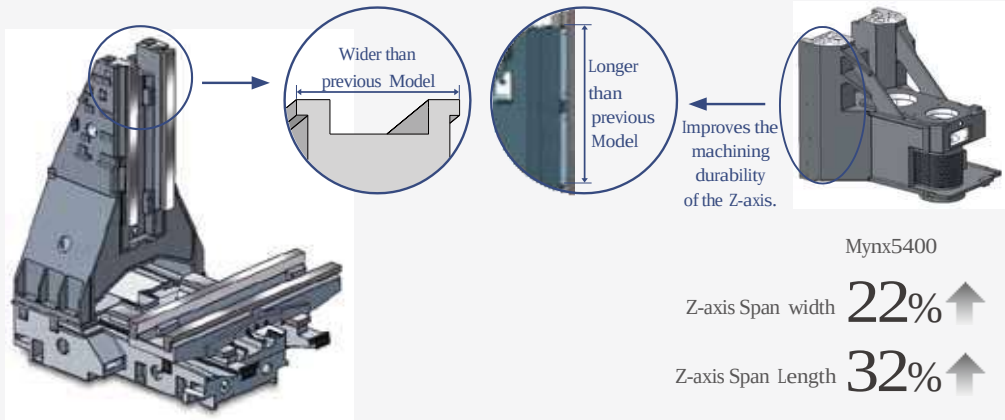


Axis Feed System

Wider box-type guideways realize high rigidity and stability, in addition to higher rapid federate.

Wider Box Guideways

The extended box-type guideways improve the machine durability as well as rigidity and stability.



Mynx5400

Z-axis Span width 22%

Z-axis Span Length 32%

Surface Finish

The surface of moving elements are coated with Rulon 142 material to reduce friction and stick-slip. This material is carefully hand-scraped to achieve optimum accuracy.

Higher Feedrate

Wider box guideways provide higher feederate. The linear axes have higher feederate by 20 ~ 25% than the previous model.

X Axis	Y Axis	Z Axis
30 m/min (1181.1 ipm)	**30 m/min (1181.1 ipm)**	**24 m/min (944.9 ipm)**

* Mynx 5400/6500/7500 Common

Table size(X Axis x Y Axis)

Table

Extended travel distance allows setting up and cutting of larger workpiece of various shapes.

Working Area

The table having the largest size of the class supports mode diversified machining operation.

Table size(X Axis x Y Axis)

Mynx 5400

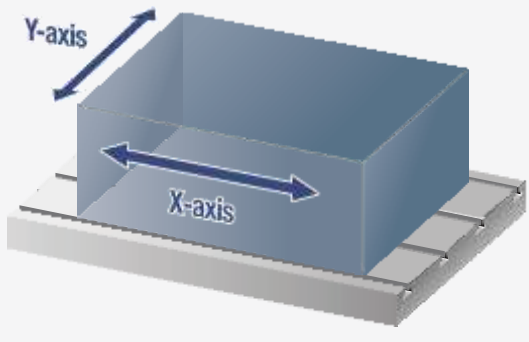
1200 x 540 mm (47.2 X 21.3 inch)

Mynx 6500

1400 x 670 mm (55.1 X 26.4 inch)

Mynx 7500

1600 x 750 mm (63.0 X 29.5 inch)



Tool Changer

Higher productivity can be achieved with the CAM-type tool changer that supports faster tool changing.

Tool Magazines by Model

Item			Mynx 5400	Mynx 6500	Mynx 7500
Taper	#40	Standard	30	30	30
		Optional	40	40	40
	#50	Standard	24	24	24
		Optional	-	30*	40*

*Chain type

Drum-type CAM magazine

***Chain type CAM magazine** (Taper #50)

Max. Tool Size

	Taper		Mynx 5400/6500/7500
Weight	#40	Length mm (inch)	300 (11.8)
		Weight kg (lb)	8 (17.6)
Length	#50	Length mm (inch)	350 (13.8)
		Weight kg (lb)	15 (33.1)

Tool Change Time (T-T-T)

Taper #40 **1.3** **s** **Taper #50** **2.5** **s**

Spindle

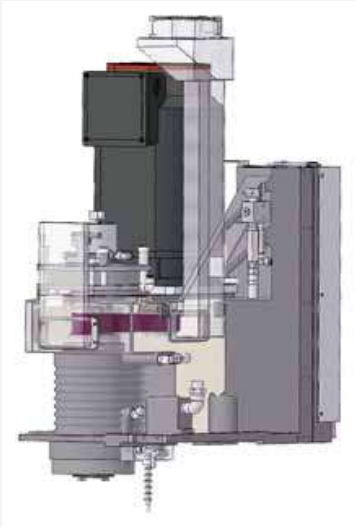
Users can select spindles of various driving systems and specifications according to the workpiece material to achieve higher productivity.

Drive Systems

The Mynx series spindles support belt-driven and gear-driven systems.

Belt-driven Type

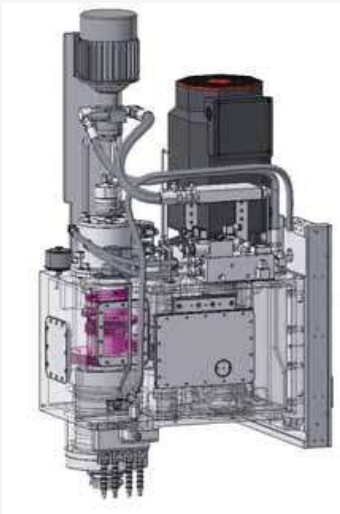
The spindle is supported on 4-rows, p4 class high precision bearings to maintain stable accuracy in long-term, high speed cutting.
The spindle is driven by a high torque spindle motor for heavy duty cutting.



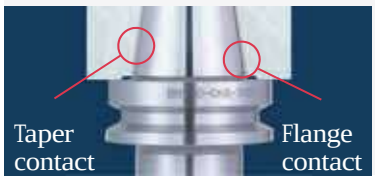
Gear-driven Type

option

The gear box spindle head applicable to BT50 model is designed in 2-step variable speed and supported with 5 high-precision angular bearings for high accuracy, heavy duty cutting (optional).



Dual Contact Spindle



The system enables simultaneous dual-contact of tapered side using elastic deformation of the spindle and perfect gauge control.

A Wide Choice of Spindles

The Mynx series' wide choice of spindle motors enables customers to optimize performance for various machining operations.

Taper [DIN]	Power Transmission	Model	Max. Spindle speed (r/min)	Spindle motor Power kW (Hp)	Max. Torque N·m (ft-lbs)	Remark
#40	Belt -driven	Mynx 5400/6500	8000	15/11 (20.1/14.8) [30min/Con.]	191.1 (141.0) [30min]	
			12000	15.6/15.6 (20.9/20.9) [30min/Con.]	165.7 (122.3) [30min]	
		Mynx 7500	12000	26/22 (34.9/29.5) [30min/Con.]	165.7 (122.3) [30min]	
#50	Belt -driven	Mynx 5400/6500	6000	15/15/11 (20.1/ 20.1 /14.8) (30min/15min/Con.]	286.4 (211.4) [15min]	
				18.5/15 (24.8/20.1) [30min/Con.]	306.9 (226.5) [30min]	
			8000	15/15/11 (20.1/ 20.1 /14.8) [30min/15min/Con.]	286.4 (211.4) [15min]	
		Mynx 7500	6000	18.5/15 (24.8/20.1) [30min/Con.]	306.7 (226.3) [30min]	
				22/18.5 (29.5/24.8) [30min/Con.]	365.5 (269.7)	
			8000	15/15/11 (20.1/ 20.1 /14.8)[30min/15min/Con.]	286.2 (211.2) [15min]	
	Gear -driven	Mynx 5400/6500/7500	6000	22/18.5 (29.5/24.8) [30min/Con.]	452.52 (334.0) [30min]	

Cutting Performance

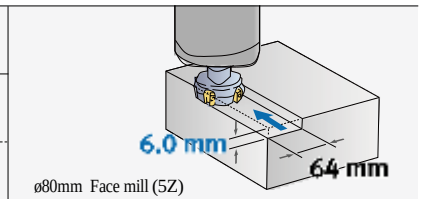
The heavy-duty machining performance of the Mynx series spindles improves the productivity.

Machining Capacity

The Mynx series provides high machining performance in various cutting processes.

Face mill BT40 Carbon steel (SM45C)

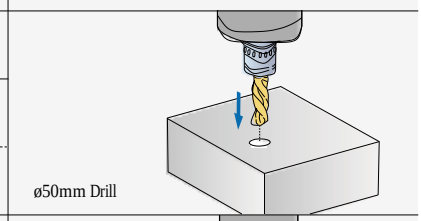
Machining rate	Spindle speed	Feedrate
422 cm^3/min (25.8 $inch^3$/min)	750 r/min	1100mm/min (43.3 ipm)



ø80mm Face mill (5Z)

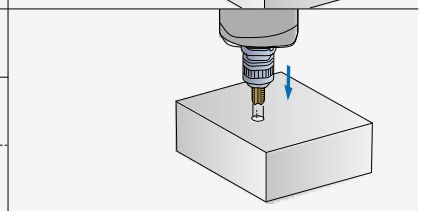
Drill BT40 Carbon steel (SM45C)

Spindle speed	Feedrate
200 r/min	42 mm/min (1.7 ipm)


ø50mm Drill

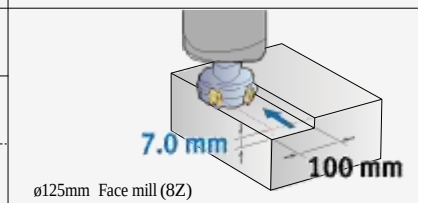
Tap BT40 Carbon steel (SM45C)

Tool	Spindle speed	Feedrate
M36 x P4.0	250 r/min	1000 mm/min (39.4 ipm)



Face mill BT50 Carbon steel (SM45C)

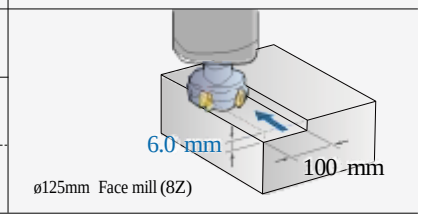
Machining rate	Spindle speed	Feedrate
504 cm^3/min (30.8 $inch^3$/min)	575 r/min	720mm/min (28.3 ipm)



ø125mm Face mill (8Z)

Face mill BT50 Gear-driven Carbon steel (SM45C)

Machining rate	Spindle speed	Feedrate
624 cm^3/min (38.1 $inch^3$/min)	464 r/min	1040 mm/min (40.9 ipm)



ø125mm Face mill (8Z)

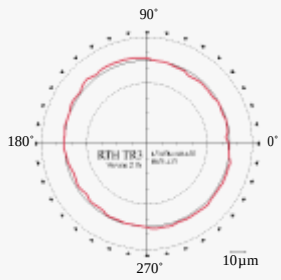
* The results, indicated in this catalogue are provides as example. They may not be obtained due to differences in cutting conditions and environmental conditions during measurement.

High Machining Accuracy

The Mynx series is equipped with the features that reduce thermal error for enhanced machining accuracy.

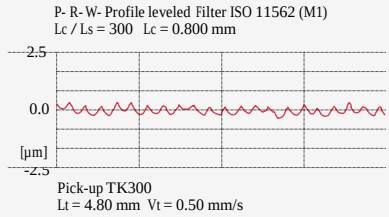
Roundness

5.8 µm



Model	Mynx 6500
Material	A7075F
Tool	Endmill ø16mm (4 blades)

Surface Roughness



Ra 0.12 µm

Spindle speed : 8000 r/min
Feedrate : 1000 mm/min (39.4ipm)

* The results, indicated in this catalogue are provides as example. They may not be obtained due to differences in cutting conditions and environmental conditions during measurement.

Standard/Optional Specifications

Diverse optional features are available to meet specific customer requirements.

● Standard ○ Optional X N/A

No.	Description	Features	Mynx 5400	Mynx 5400/50	Mynx 6500	Mynx 6500/50	Mynx 7500	Mynx 7500/50
1	Air blower		○	○	○	○	○	○
2	Air gun		○	○	○	○	○	○
3	Automatic tool changer	24 Tools	X	●	X	●	X	●
4		30 Tools	●	X	●	○	●	X
5		40 Tools	○	X	○	X	○	○
6	Automatic workpiece measurement	None	●	●	●	●	●	●
7		OMP60_RENISHAW	○	○	○	○	○	○
8	Automatic Tool Length Measurement	TS27R : RENISHAW	○	○	○	○	○	○
9	Automatic tool measurement master tool	Calibration block	○	○	○	○	○	○
10	Chip conveyor	Hinge / Scraper / Drum filter type	○	○	○	○	○	○
11	Coolant chiller		○	○	○	○	○	○
12	Coolant gun		○	○	○	○	○	○
13	Coolant tank		●	●	●	●	●	●
14	Easy Operation Package	Tool load monitor	●	●	●	●	●	●
15		Alram / M-code / G-code / ATC recovery help	●	●	●	●	●	●
16		Table moving for setup / Easy work coordinate setting	●	●	●	●	●	●
17	Electric cabinet air conditioner		○	○	○	○	○	○
18	Electric cabinet light		○	○	○	○	○	○
19	Electric cabinet line filter		○	○	○	○	○	○
20	Gravity axis drop prevention		○	○	○	○	○	○
21	Linear scale	X, Y, Z Axes	○	○	○	○	○	○
22	MPG	1 MPG_PORTABLE TYPE	●	●	●	●	●	●
23		1 MPG_PORTABLE_W/ENABLE TYPE	○	○	○	○	○	○
24	MQL		○	○	○	○	○	○
25	NC system	DOOSAN FANUC i	●	●	●	●	●	●
26		FANUC 32i	○	○	○	○	○	○
27		HEIDENHAIN iTNC 530	○	○	○	○	○	○
28		SIEMENS SINUMERIK 828D	○	○	○	○	○	○
29	NC system lcd size	10.4 inch (Color)	●	●	●	●	●	●
30	Oil cooler	6000 r/min, Belt type	X	○	X	○	X	○
31		6000 r/min, Gear type	X	●	X	●	X	●
32		8000 r/min, Belt type	○	●	○	●	○	●
33		12000 r/min, Belt type	●	X	●	X	●	X
34	Oil Skimmer	Belt type	○	○	○	○	○	○
35	Power transformer		○	○	○	○	○	○
36	Screw chip conveyor		●	●	●	●	●	●
37	Show coolant		○	○	○	○	○	○
38	Spindle motor power	15 / 11 kW (20.1 / 14.8 Hp)	●	X	●	X	X	X
39		15.6 / 15.6 kW (20.9 / 20.9 Hp)	○	X	○	X	X	X
40		22 / 15 kW (29.5 / 20.1 Hp)	X	X	X	X	X	X
41		26 / 22 kW (34.9 / 29.5 Hp)	X	X	X	X	●	X
42		15 / 15 / 11 kW (20.1 / 20.1 / 14.8 Hp)	X	●	X	●	X	○
43		18.5 / 15 kW (24.8 / 20.1 Hp)	X	○	X	○	X	●
44		22 / 18.5 kW (29.5 / 24.8 Hp)	X	○(Gear)	X	○(Gear)	X	○(Gear)
45	Spindle speed	6000 r/min	X	●(Belt) ○(Gear)	X	●(Belt) ○(Gear)	X	●(Belt) ○(Gear)
46		8000 r/min	●	○	●	○	X	○
47		12000 r/min	○	X	○	X	●	X
48	Test bar		○	○	○	○	○	○
49	Through spindle coolant	NONE	●	●	●	●	●	●
50		1.5KW	○	○	○	○	○	○
51		4.0KW	○	○	○	○	○	○
52		5.5KW_DUAL BAG	○	○	○	○	○	○
53	Work & tool counter	Work / Tool	○	○	○	○	○	○

※ Contact Doosan for more information

Optional Equipments

A wide range of solutions are available that can be optimized to suit customers specific need.

Equipments to Minimize Thermal Error

Adopting internal air circulation system, the Mynx series can reduce Y axis thermal error by more than 40% compared to previous models. High accuracy can be maintained over a long-term operation.

Oil Cooler option

An oil cooler correlated to room temperature can be equipped for a long-term operation at high speed. Cooling oil circulates around the spindle bearings to prevent thermal error of the spindle and maintain machining accuracy.

* For more machine's details, please check the page 9.

Coolant Chiller (strongly recommended) option

A re-circulating chiller unit controls the temperature of the coolant fluid used during the machining process and thereby reduces the thermal effects on machine precision.

Linear Scale option

Using the linear scale feedback system, accuracy of the machine can be further improved since the X, Y and Z axes can be controlled to correct positions.

Resolution : 0.001 mm

Automatic Tool Length Measuring Equipment option

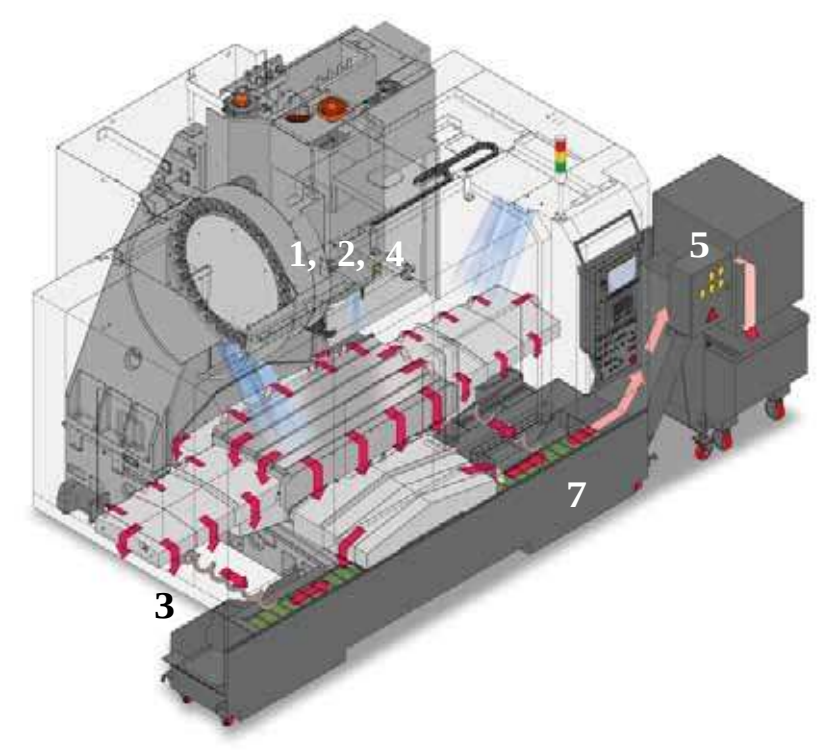
Minimum Quantity Lublication option

Automatic Workpiece Measuring Equipment option

Oil skimmer option

Easy and effective chips disposal

The Mynx series machines are designed to collect the coolant spilled from the table into a front-mounted chip pan for effective chip disposal via chip conveyor. The chip conveyor can exit left or right hand side.

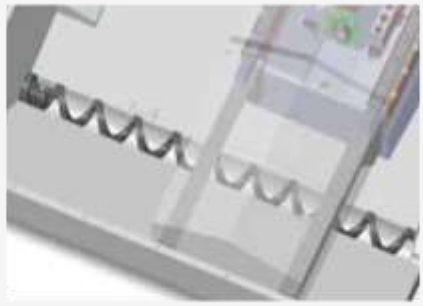


1. Through-Spindle Coolant System option

Middle pressure : 1.96 Mpa(284.2 psi) [20 bar]
High pressure : 6.86 Mpa (994.7 psi) [70 bar]

2. Shower coolant option

3. Internal Screw Conveyor



4. Coolant System

5. Chip conveyor option

Hinge type

Scraper type

Drum filter type

6. Coolant Gun option

7. Large capacity coolant tank built-in with chip pan and box filter

Mynx 5400 : **380ℓ(100.4** galon)

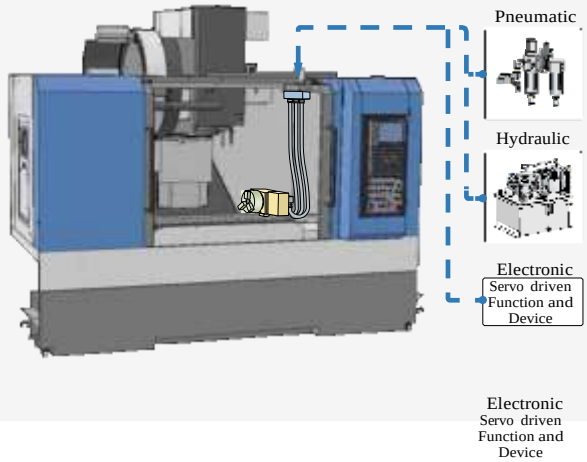
Mynx 6500 : **380ℓ(100.4** galon)

Mynx 7500 : **430ℓ(113.6** galon)

Diverse Options

A wide range of options are offered for higher work efficiency and convenience of the customers.

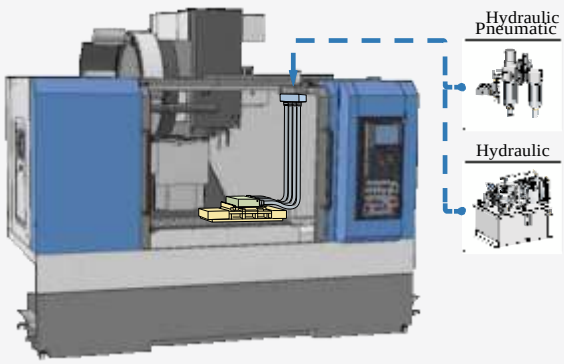
Interface for Additional Equipment (4 Axes)



※ Please check the driving system (hydraulic or pneumatic) of the rotary table before ordering the machine.

Electronic
Servo driven Function and Device
Pneumatic

Hydraulic fixture line



Fixture check list (for hydraulic / pneumatic fixtures)

- Pressure source Hydraulic
  - ☐ P/T ☐ A/B
  - Pneumatic ☐ P/T ☐ A/B
- Number of ports
  - ☐ 1pair (2-PT 3/8"port)
  - ☐ 2pair (4-PT 3/8"port)
  - ☐ 3pair (6-PT 3/8"port)
- Hydraulic power unit

Supply scope : ☐ User ☐ DOOSAN

(Please check the below detail specification,if you want Doosan to supply.)

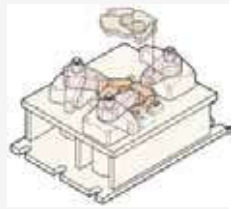
☐ Use Doosan standard unit

24ℓ / min (6.3 galon/min),

4.9 MPa (711 psi)

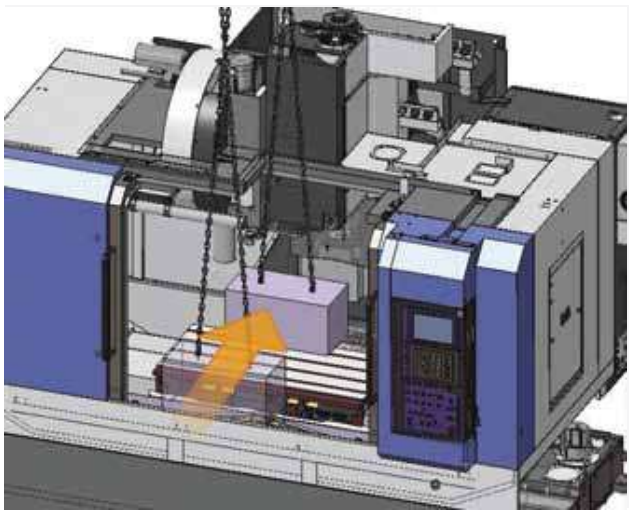
☐ Special requirement

_____ℓ / min(galon/min), _____MPa(p



※ Contact Doosan for more information

Loading the Workpiece



Excellent Accessibility

Improved accessibility to machine allows easier mounting of workpieces.

A

B

C

	A	B	C
Mynx 5400	830 mm (32.7 inch)	290 mm(11.4 inch)	950 mm(37.4 inch)
Mynx 6500	895 mm(35.2 inch)	224 mm(8.8 inch)	950mm(37.4 inch)
Mynx 7500	1077 mm(42.4 inch)	321 mm(12.6 inch)	1050 mm(41.3 inch)

Convenient Operation

User convenience has been significantly enhanced with a new operation panel.

Simple and Convenient Operation Panel

The operation panel is redesigned and integrated for better usability. Additionally, customized function switches can be attached to maximize operation convenience.

1. 10.4" color TFT LCD monitor

Various alarm messages indicating errors from the machine and controller will be displayed on a large 10.4" LCD screen, enhancing the operation convenience.

MPG handle

PCMCIA Card & USB Port

PCMCIA Card

The PCMCIA card enables uploading and downloading of the NC program, NC parameters, tool information, and ladder programs, and also supports DNC operation.

USB Port

The USB memory stick enables uploading and downloading of the NC program, NC parameters, tool information and ladder programs. (DNC operation is not supported.)

Convenience Functions (Hot Keys)

Swiveling operation panel

The operation panel is capable of swiveling by 90 degrees to enhance convenience.

Easy Operation Package (E.O.P)

These Doosan software packages have been customized to provide fast and easy setup of tooling, workpiece, and program. These functions minimize the idle time caused by process setup and maximize the machine's productivity.

Adaptive Feed Control (AFC)

Function to control feedrate so that the cutting can be carried out at a constant load
(To adapt to the spindle load set up with constant load feedrate control function)

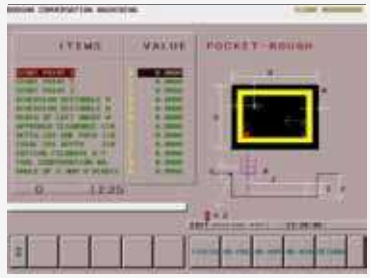
Tool Management

Function to manage tool information
[Tool information]
- Tool No. / Tool name
- Tool condition : normal, large diameter, worn/damaged, used for the first time, manual

Tool Load Monitor

Function to automatically monitor tool load (Different loads can be set for one tool according to M700 ~ M704)

Pattern Cycle & Engraving



Function to create frequently-used cutting programs automatically
- Pattern Cycle: creates a program for a pre-defined shape
- Engraving: creates a program for cutting a shape described with characters option

Work Offset Setting

Function to configure various work offset settings

Alarm Guidance

Function to show detailed info on frequently triggered alarms and recommended actions

Sensor Status Monitor

Function to view sensor conditions of the machine

ATC Recovery

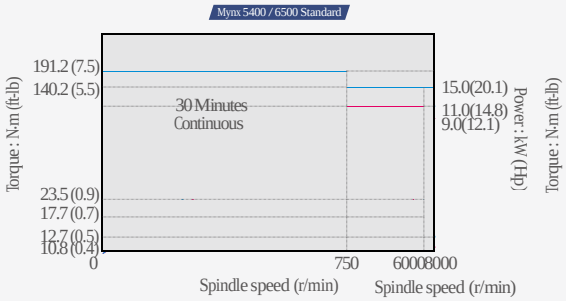
Function to view detailed info with recommended actions and to perform step-by-step operation manually
(when an alarm is triggered during an ATC operation)

Spindle Power – Torque Diagram

Taper 40 : Belt driven type

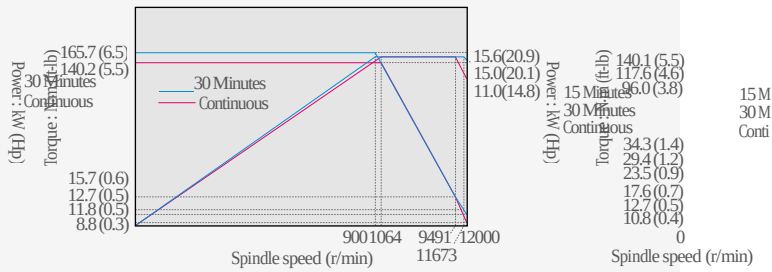
8000 r/min | Belt driven | Mynx 5400 / 6500

Spindle motor power 15/11 kW (20.1/14.8 Hp)



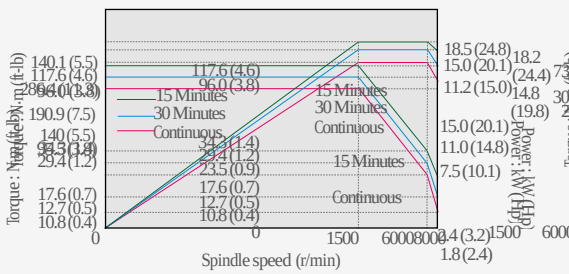
12000 r/min | Belt driven | Mynx 5400 / 6500

Spindle motor power 15.6/15.6 kW (20.9/20.9 Hp)



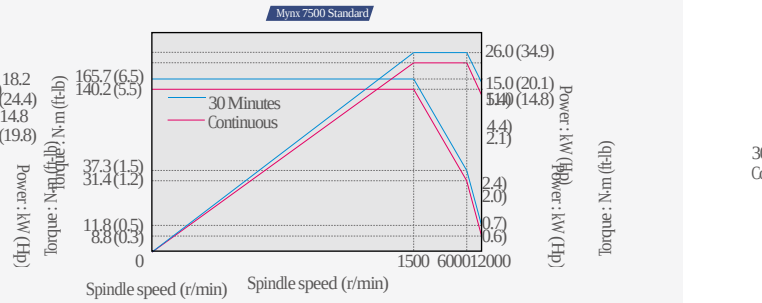
8000 r/min | Belt driven | Mynx 7500

Spindle motor power 22/15 kW (29.5/20.1 Hp)



12000 r/min | Belt driven | Mynx 7500

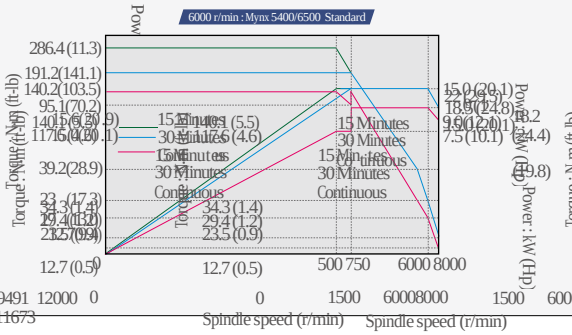
Spindle motor power 26/22 kW(34.9/29.5 Hp)



Taper 50 : Belt driven type

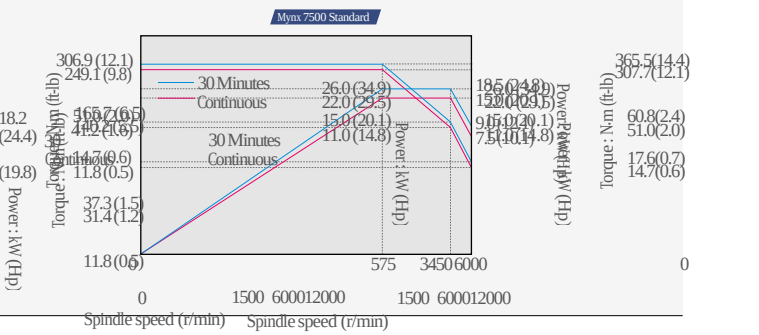
6000 r/min | Belt driven | Mynx 5400 / 6500
8000 r/min | Belt driven | Mynx 5400 / 6500 / 7500

Spindle motor power 15/15/11 kW (20.1/20.1/14.8 Hp)



6000 r/min | Belt driven | Mynx 5400 / 6500 / 7500

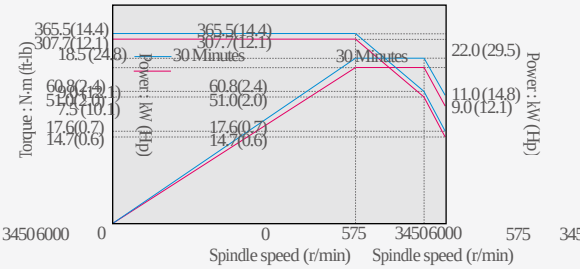
Spindle motor power 18.5/15 kW (24.8/20.1 Hp)



Taper 50 : Belt driven type

6000 r/min | Belt driven | Mynx 7500

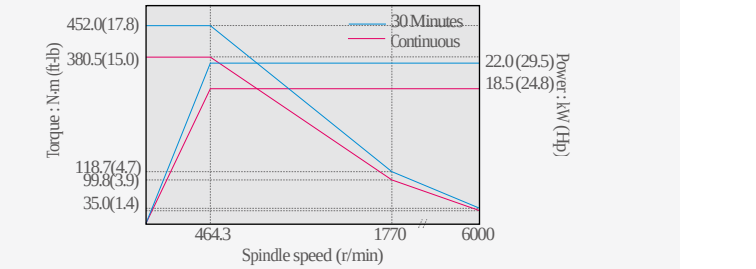
Spindle motor power 22/18.5 kW (29.51/24.8 Hp)



Taper 50 : Gear driven type

6000 r/min | Gear driven | Mynx 5400 / 6500 / 7500

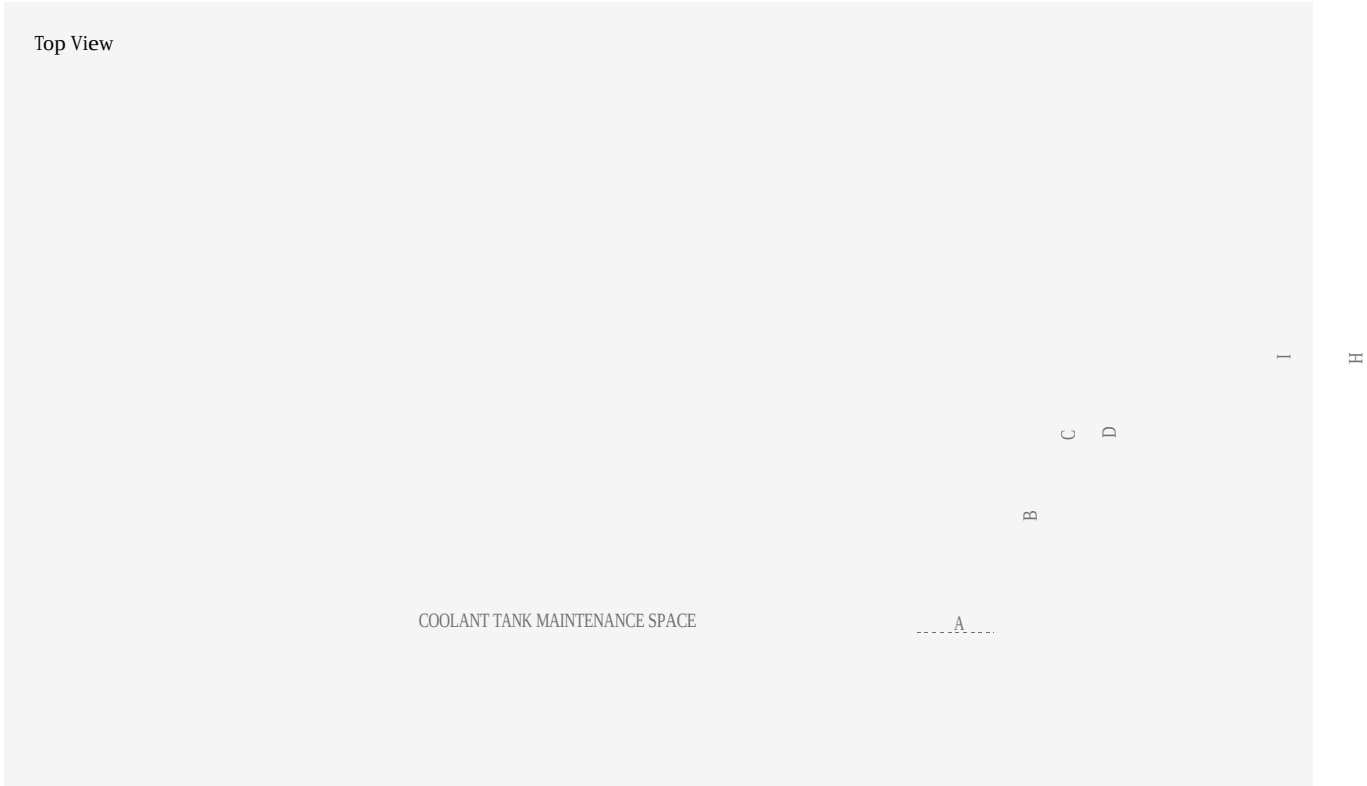
Spindle motor power 22/18.5 kW (29.5/24.8 Hp)



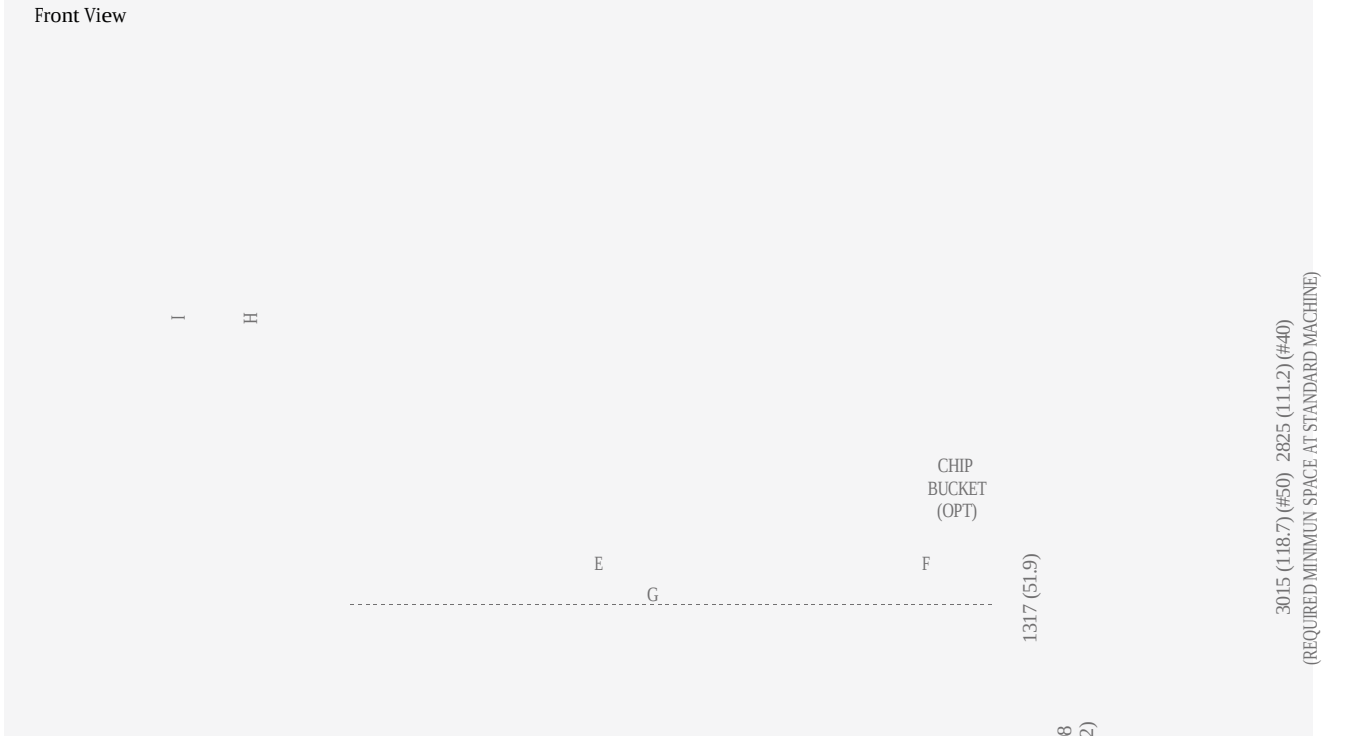
Mynx 5400 / 6500

Unit : mm (inch)

Top View



Front View



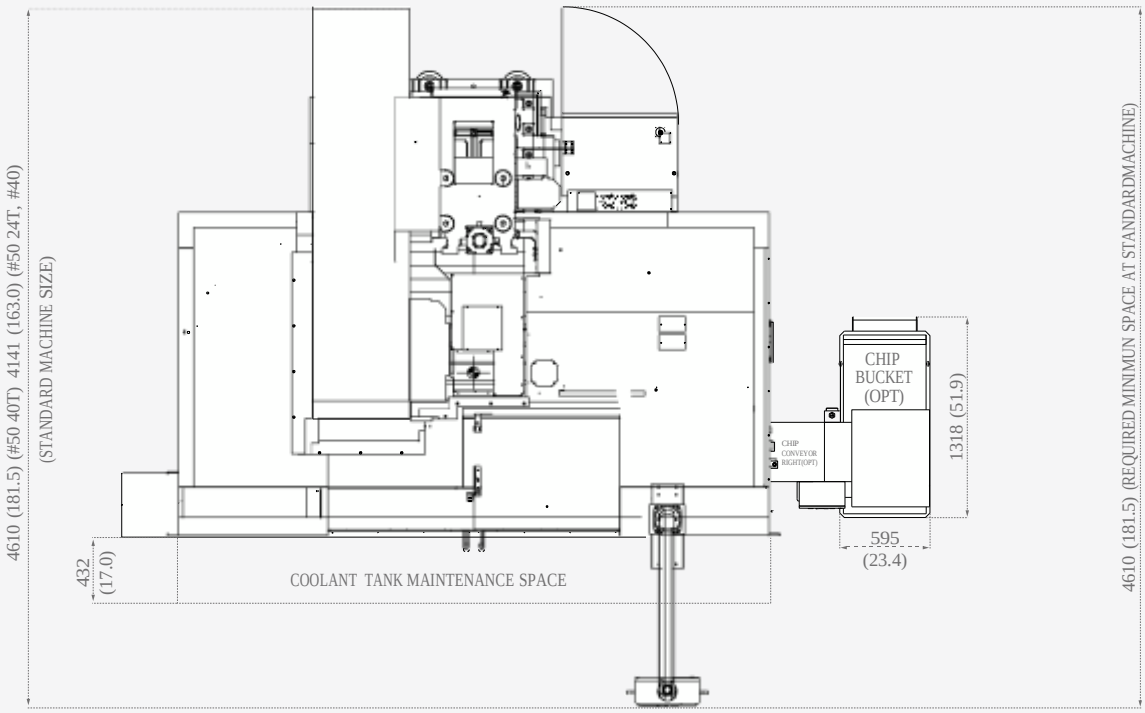
Model	Unit	A	B	C		D	E	F	G	H				I	
										#40 / 30 Tools	#40 / 40 Tools	#50 / 24 Tools	#50 / 30 Tools	#40	#50
Mynx 5400	mm (inch)	594 23.4)	1317 (51.9)	2467 (97.1)		3443 (135.6)	3350 (131.9)	972 (38.3)	4322 (170.2)	2600 (102.4)	2651 (104.4)	2882 (113.5)	-	2800 (110.2)	3015 (118.7)
Mynx 6500				#40 : 2692 (106.0)	#50 / 30 Tools : 2890 (113.8)	3664 (144.3)				2715 (106.9)	2766 (108.9)	2968 (116.9)	2991 (117.8)	2825 (111.2)	

External Dimensions

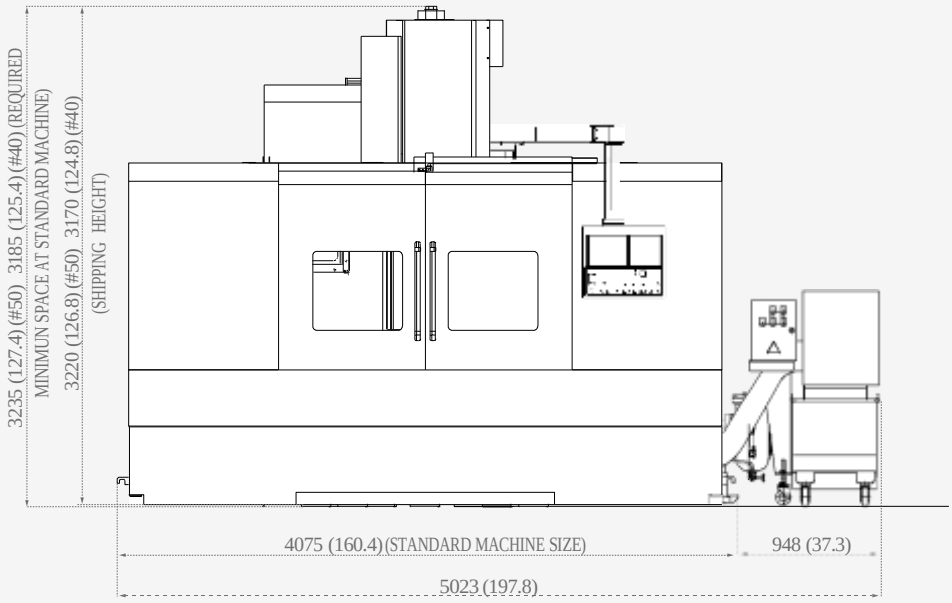
Mynx 7500

Unit : mm (inch)

Top View



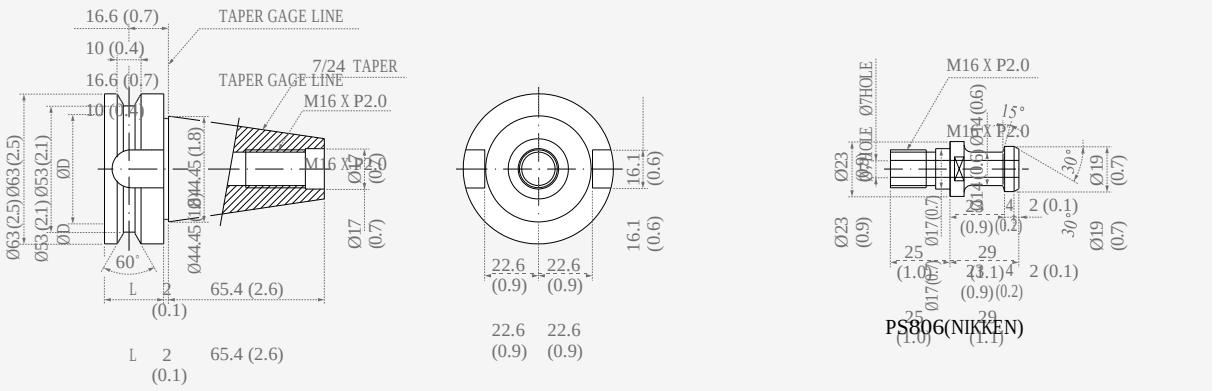
Front View



#40 Tool

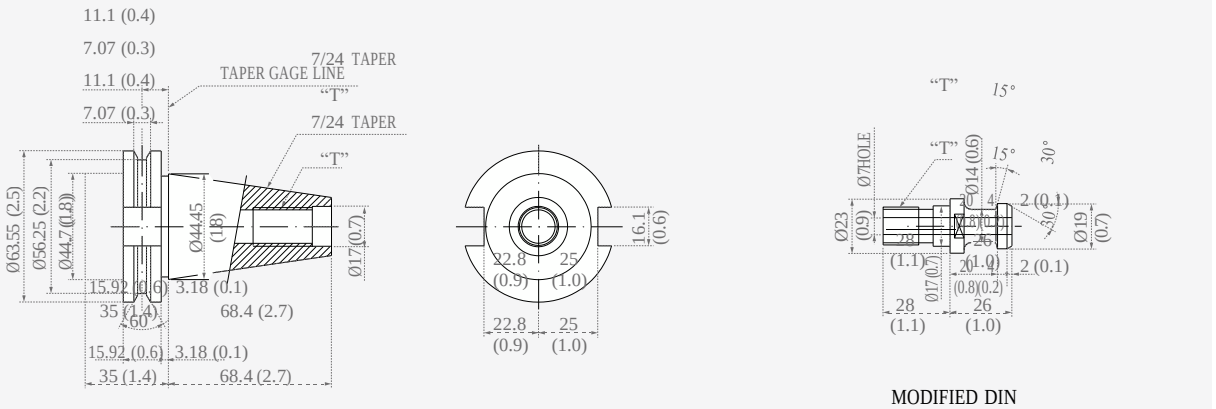
MAS403 BT40

Unit : mm (inch)



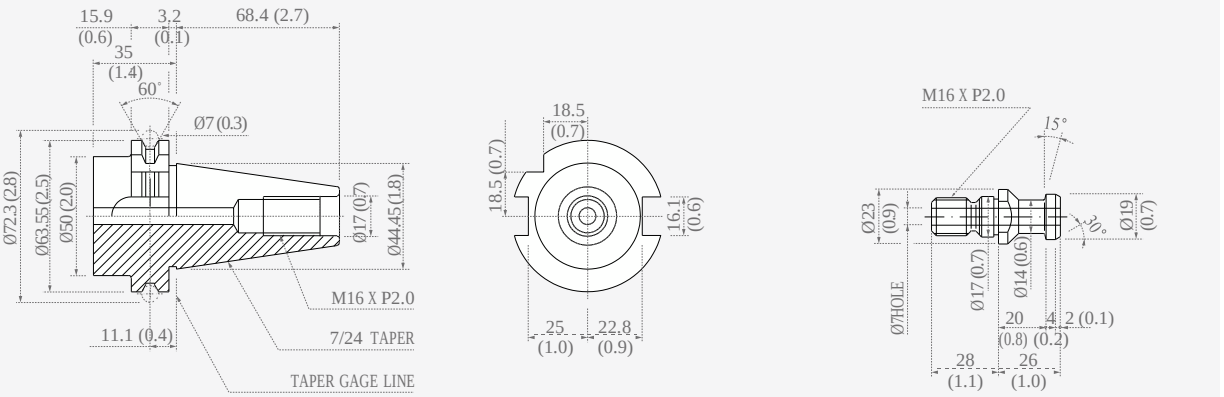
CAT 40 option

Unit : mm (inch)



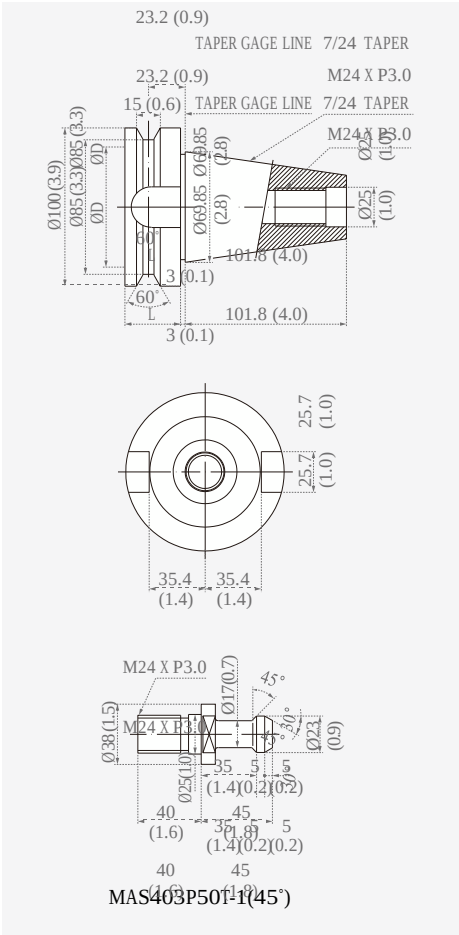
DIN 69871-A40 option

Unit : mm (inch)



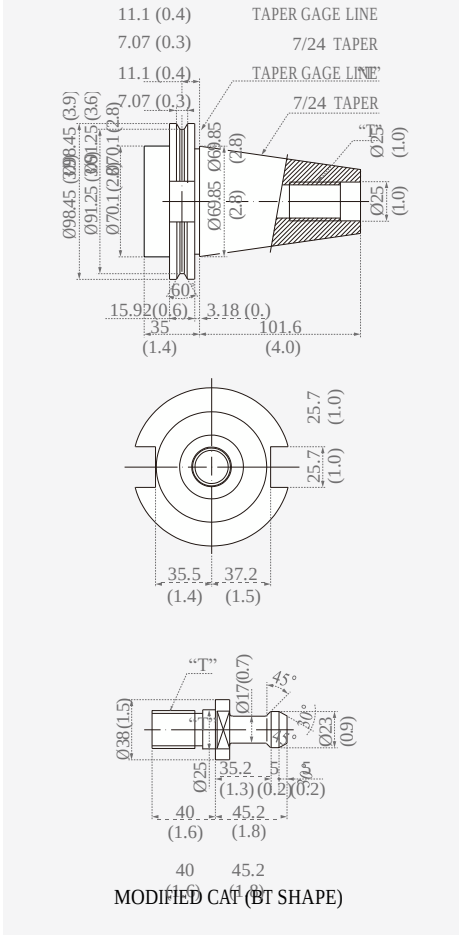
#50 Tool

MAS403 BT50 Unit : mm (inch)



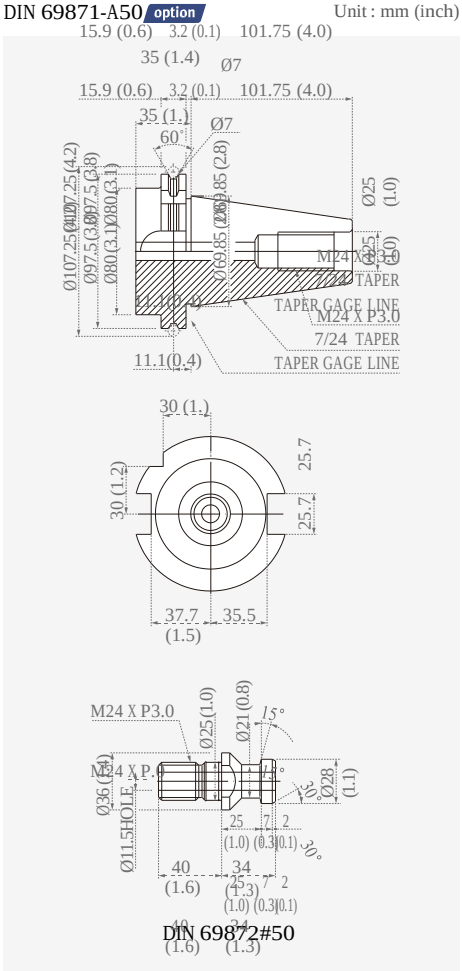
MAS403P50T-1(45°)

CAT 50 option Unit : mm (inch)



MODIFIED CAT (BT SHAPE)

DIN 69871-A50 option Unit : mm (inch)

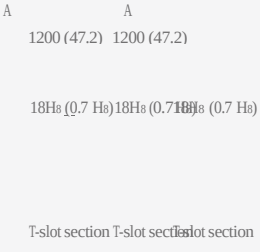


DIN 69872#50

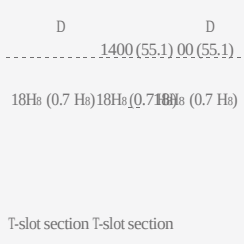
Table dimension

Unit : mm (inch)

Mynx 5400



Mynx 6500



Mynx 7500

A	B	C	D	E	F	G	H	I	K
600 (23.6)	82.5 (3.2)	125 (4.9)	700 (27.6)	85 (3.3)	125 (4.9)	800 (31.5)	375 (14.8)	62.5 (2.5)	125 (4.9)

Machine Specifications

Item			Unit	Mynx 5400	Mynx 5400/50	Mynx 6500	Mynx 6500/50	Mynx 7500	Mynx 7500/50
Travels	Travel (X / Y / Z-axis)		mm (inch)	1020/540/530 (40.2/21.3/20.9)		1270/670/625 (50.0/26.4/24.6)		1525/762/625 (60.0/30.0/24.6)	
	Distance from nose to table top		mm (inch)	150-680 (5.9-26.8)	200-730 (7.9-28.7)	150-775 (5.9-30.5)	200-825 (7.9-32.5)	150-775 (5.9-30.5)	200-825 (7.9-32.5)
	Distance from center to column		mm (inch)	567 (22.3)		722 (28.4)		785 (30.9)	
Feedrate	Rapid traverse (X / Y / Z)		m/min (ipm)	30 / 30 / 24 (1181.1/1181.1/944.9)					
	Cutting feedrate		mm/min (ipm)	12000 (472.4)					
Table	Table size		mm(inch)	1200 x 540(47.2x21.3)		1400 x 670(55.1x26.4)		1600 x 750(63.0x29.5)	
	Table loading capacity		kg (lb)	800 (1763.7)		1000 (2204.6)		1500 (3306.9)	
	Table surface		mm (inch)	4-125 x 18H_8 (4-4.9 x 0.7H_8)		5-125 x 18H_8 (5-4.9 x 0.7H_8)		6-125 x 18H_8 (5-4.9 x 0.7H_8)	
Spindle	Max. spindle speed	Belt	r/min	8000 {12000}	6000 {6000, 8000}	8000 {12000}	6000 {6000, 8000}	12000	6000 {8000}
		Gear	r/min	-	{6000}	-	{6000}	-	{6000}
	Spindle Taper			ISO #40, 7/24 Taper	ISO #50, 7/24 Taper	ISO #40, 7/24 Taper	ISO #50, 7/24 Taper	ISO #40, 7/24 Taper	ISO #50, 7/24 Taper
	Max. Torque	Belt 6000	N·m (ft-lb)	-	286.4(211.4) {306.9(226.5)}	-	286.4(211.4) {306.9(226.5)}	-	306.7(226.5) {365.5(269.7)}
		Belt 8000	N·m (ft-lb)	191.1 (141.0)	{286.4 (211.4)}	191.1 (141.0)	{286.4}	-	{286.2 (211.2)}
		Belt 12000	N·m (ft-lb)	{165.7 (122.3)}	-	{165.7 (122.3)}	-	{165.7 (122.3)}	-
		Gear 6000	N·m (ft-lb)	-	{452.52 (334.0)}	-	{452.52 (334.0)}	-	{452.52 (334.0)}
ATC	Type of tool shank※			BT,DIN 40	BT,DIN 50	BT,DIN 40	BT,DIN 50	BT,DIN 40	BT,DIN 50
	Tool storage capacity		ea	30 {40}	24	30 {40}	24 {30}	30 {40}	24 {40}
	Max. tool diameter Without Adjacent Tools		mm (inch)	80 {76} /125 (3.1 {(3.0)} /4.9)	125 / 220 (4.9/8.7)	80 {76} / 125 80 {76} / 125	125 / 220 (4.9/8.7)	80{76} / 125 80 {76} / 125	125/230 (4.9/9.05)
	Max. tool length		mm(inch)	300(11.8)	350(13.8)	300(11.8)	350(13.8)	300(11.8)	350(13.8)
	Max. tool weight		kg (lb)	8 (17.6)	15 (33.1)	8 (17.6)	15 (33.1)	8 (17.6)	15 (33.1)
	Tool selection			Memory Random					
	Tool change time (T-T-T)		s	1.3	2.5	1.3	2.5	1.3	2.5
	Tool change time (C-T-C)		s	3.7	5.5	3.7	5.5	3.7	6.0
Motors	Spindle motor power	Belt 6000	kW (Hp)	-	15 / 15 / 11 {18.5 / 15}	-	15 / 15 / 11 {18.5 / 15}	-	18.5 / 15 {22 / 18.5}
		Belt 8000	kW (Hp)	15 (20.1)/ 11 (14.8)	{15 (20.1) / 15 (20.1)/ 11 (14.8)}	15 (20.1)/ 11 (14.8)	{15 (20.1) / 15 (20.1)/ 11 (14.8)}	-	{15 (20.1) / 15 (20.1)/ 11 (14.8)}
		Belt 12000	kW (Hp)	{15.6 (20.9) / 15.6 (20.9)}	-	{15.6 (20.9) / 15.6 (20.9)}	-	{26 (34.9)/ 22 (29.5) }	-
		Gear 6000	kW (Hp)	-	{22 (29.5)/ 18.5 (24.8)}	-	{22 (29.5)/ 18.5 (24.8)}	-	{22 (29.5)/ 18.5 (24.8)}
	Feed motor (X / Y / Z)		kW (Hp)	3.0 (4.0) / 3.0 (4.0) / 4.0 (5.4)		4.0 (5.4) / 4.0 (5.4) / 7.0 (9.4)			
Power source	Electric power supply (Rated capacity)	Belt 8000 (12000)	kVA	36.1 (40)	-	39.4 {45.1}	-	48 (42.9, 56.9)	-
		Belt 6000	kVA	-	36.1 (40)	-	44.6 {39.4}	-	47.3 {51.8}
		Gear 6000	kVA	-	{47.7}	-	{48.4}	-	{51.8}
		Belt 8000	kVA	-	{36.1}	-	{39.4}	-	{42.9}
Tank capacity	Coolant tank capacity		ℓ(galon)	380 (100.4)					
	Lubrication tank capacity		ℓ(galon)	4.3 (1.1)					
Machine size	Machine dimension (L x W)	Without Chip conveyor	mm (inch)	2467 x 3350 (97.1 x 131.9)	2467 x 3350 (97.1 x 131.9)	2692 x 3350 (106 x 131.9)	2692 x 3350 (106 x 131.9) {30 Tools : 2890(113.8) x 3350(131.9)}	4141 x 4075 (163 x 160.4)	4141 x 4075 (163 x 160.4) {40 Tools : 4610(181.5) x 4075(160.4)}
		With Chip conveyor		2467 x 4322 (97.1 x 170.2)	2467 x 4322 (97.1 x 170.2)	2692 x 4322 (106 x 170.2)	2692 x 4322 (106 x 170.2) {30 Tools : 2890(113.8) x 4322(170.2)}	4141 x 5023 (163 x 197.8)	4141 x 5023 (163 x 197.8) {40 Tools : 4610(181.5) x 5023(197.8)}
	Machine height		mm (inch)	2800 (110.2)	3015 (118.7)	2825 (111.2)	3015 (118.7)	3185 (125.4)	3235 (127.4)
	Machine weight		kg (lb)	7000 (15432.4)	7200 (15873.3)	9000 (19841.6)	9200 (20282.5)	13500 (29762.4)	13500 (29762.4)
Control	NC System			DOOSAN FANUC i { FANUC 32i / iTNC 530 / SINUMERIK 828D }					

* { } : option

NC Unit Specifications

● Standard ○ Optional X N/A

FANUC

No.	Item		Spec.	DOOSAN FANUC i	FANUC 32i
1	AXES CONTROL	Controlled axes	3 (X,Y,Z)	X, Y, Z	X, Y, Z
2		Least command increment	0.001 mm (0.00 inch) / 0.0001"	●	●
3		Least input increment	0.001 mm (0.00 inch) / 0.0001"	●	●
4	INTERPOLATION & FEED FUNCTION	2nd reference point return	G30	●	●
5		3rd / 4th reference return		●	○
6		Inverse time feed		●	○
7		Cylinderical interpolation	G07.1	●	○
14		Smooth backlash compensation		○	●
15		Automatic corner override	G62	●	○
16		Manual handle feed	Max. 3unit	1 unit	1 unit
17		Manual handle feed rate	x1, x10, x100 (per pulse)	●	●
18		Handle interruption		●	○
22		AI APC	20 BLOCK	●	X
23		AICC I	30 BLOCK	–	●
32	SPINDLE & M-CODE FUNCTION	M- code function		●	●
33		Retraction for rigid tapping		●	●
34		Rigid tapping	G84, G74	●	●
35	TOOL FUNCTION	Number of tool offsets	64 ea	–	64 ea
38		Number of tool offsets	400 ea	400 ea	○
40		Tool nose radius compensation	G40, G41, G42	●	●
41		Tool length compensation	G43, G44, G49	●	●
42		Tool life management		●	●
43		Addition of tool pairs for tool life management		●	○
44		Tool offset	G45 - G48	●	○
45	PROGRAMMING & EDITING FUNCTION	Custom macro		●	●
46		Macro executor		●	●
47		Extended part program editing		●	●
48		Part program storage	256KB(640m)	–	640m
49		Part program storage	512KB(1,280m)	1280m	○
54		Inch/metric conversion	G20 / G21	●	●
55		Number of Registered programs	400 ea	400 ea	–
56		Number of Registered programs	500 ea	–	500 ea
59		Optional block skip	9 BLOCK	●	○
60		Optional stop	M01	●	●
61		Program file name	32 characters	–	●
62		Program number	O4-digits	●	–
63		Playback function		●	○
64		Addition of workpiece coordinate system	G54.1 P1 - 48 (48 pairs)	48 pairs	48 pairs
66	OTHERS FUNCTIONS (Operation, setting & Display, etc)	Embeded Ethernet		●	●
67		Graphic display	Tool path drawing	●	●
68		Loadmeter display		●	●
69		Memory card interface		●	●
70		USB memory interface	Only Data Read & Write	●	●
71		Operation history display		●	●
72		DNC operation with memory card		●	●
73		Optional angle chamfering / corner R		●	●
74		Run hour and part number display		●	●
75		High speed skip function		●	○
76		Polar coordinate command	G15 / G16	●	○
78		Programmable mirror image	G50.1 / G51.1	●	○
79		Scaling	G50, G51	●	○
80		Single direction positioning	G60	●	○
81		Pattern data input		●	○

HEIDENHAIN

● Standard ○ Optional X N/A

No.	Item		Spec.	iTNC 530
1	Axes	Controlled axes	3 axes	X, Y, Z
2			4 axes	○
3		Controlled axes	Max. 18 axes in total	○
4		Least command increment	0.0001 mm (0.0001 inch), 0.0001°	●
5		Least input increment	0.0001 mm (0.0001 inch), 0.0001°	●
6		Maximum commandable value	±99999.999mm (±3937 inch)	●
7		Axis feedback control	Double-speed control loops for high-frequency spindles and torque/linear motors	○
8		MDI / DISPLAY unit	15.1 inch TFT color flat panel	●
9			19 inch TFT color flat panel	○
10		Program memory for NC programs	SSDR	21GB
11		Block processing time		0.5 ms
12		Cycle time for path interpolation	CC 61xx	3 ms
13		Encoders	Absolute encoders	EnDat 2.2
14	Commissioning and diagnostics	Data interfaces	Ethernet interface	●
15			USB interface (USB 2.0)	●
16	Machine functions	Look-ahead	Intelligent path control by calculating the path speed ahead of time (max. 1024 blocks.)	●
17		HSC filters		●
18		Switching the traverse ranges		●
19	User functions	Program input	According to ISO	●
20			With smarT.NC	●
21		Position entry	Nominal positions for lines and arcs in Cartesian coordinates	●
22			Incremental or absolute dimensions	●
23			Display and entry in mm or inches	●
24			Display of the handwheel path during machining with handwheel superimpositioning	●
25			Paraxial positioning blocks	●
26		Tool compensation	In the working plane and tool length	●
27			Radius-compensated contour lookahead for up to 99 blocks (M120)	●
28			Three-dimensional tool radius compensation	●
29		Tool table	Central storage of tool data	●
30			Multiple tool tables with any number of tools	●
31		Cutting-data table	Calculation of spindle speed and feed rate based on stored tables	●
32		Constant contouring speed	relative to the path of the tool center or to the tool's cutting edge	●
33		Parallel operation	Creation of a program while another program is being run	●
34		Tilting the working plane with Cycle 19		○
35		Tilting the working plane with the PLANE function		○
36		Manual traverse in tool-axis direction	after interruption of program run	●
37		Function TCPM	Retaining the position of tool tip when positioning tilting axes	●

NC Unit Specifications

● Standard ○ Optional X N/A

No.	Item		Spec.	iTNC 530
38	User functions	Rotary table machining	Programming of cylindrical contours as if in two axes	○
39			Feed rate in distance per minute	○
40		FK free contour programming	forworkpieces not dimensioned for NC programming	●
41		Program jumps	Subprograms and program section repeats	●
42			Calling any program as a subprogram	●
43		Program verification graphics	Plan view, view in three planes, 3-D view	●
44		Programming graphics	3-D line graphics	●
45		Program-run graphics	(plan view, view in three planes,3-D view)	●
46		Datum tables	Saving of workpiece-specific datums	●
47		Preset table	Saving of reference points	●
48		Freely definable table	after interruption of program run	●
49		Returning to the contour	With mid-program startup	●
50			After program interruption(with the GOTO key)	●
51		Autostart		●
52		Actual position capture		●
53		Enhanced file management		●
54		Context-sensitive help for error messages		●
55		TNCguide	Browser-based, context-sensitive helpsystem	●
56		Calculator		●
57		Entry of text and special characters		●
58		Comment blocks in NC program		●
59		"Save As" function		●
60		Structure blocks in NC program		●
61		Entry of feed rates	FU (feed per revolution)	●
62			FZ (tooth feed per revolution)	●
63			FT (time in seconds for path)	●
64			FMAXT (only for rapid traverse pot: time in seconds for path)	●
65		Dynamic collision monitoring (DCM)		○
66		Fixture monitoring		○
67		Processing DXF data		○
68		Global program settings (GS)		○
69		Adaptive feed control (AFC)		○
70		KinematicsOpt	Automatic measurement and optimization of machine kinematics	○
71		KinematicsComp	Three-dimensional compensation	○
72		3D-ToolComp	Dynamic 3-D tool radius compensation	○
73	Fixed cycles	Working plane	Cycle 19	○
74		Cylinder surface	Cycle 27	○
75		Cylinder surface slot milling	Cycle 28	○
76		Cylinder surface ridge milling	Cycle 29	○
77	Cycles for automatic workpiece inspection	Calibrate TS		●
78		Calibrate TS length		●
79		Measure axis shift		●
80		Save kinematics		○
81		Measure kinematics		○
82		Preset compensation		○
83	Options	Software option 1		○
84		Software option 2		○

SIEMENS

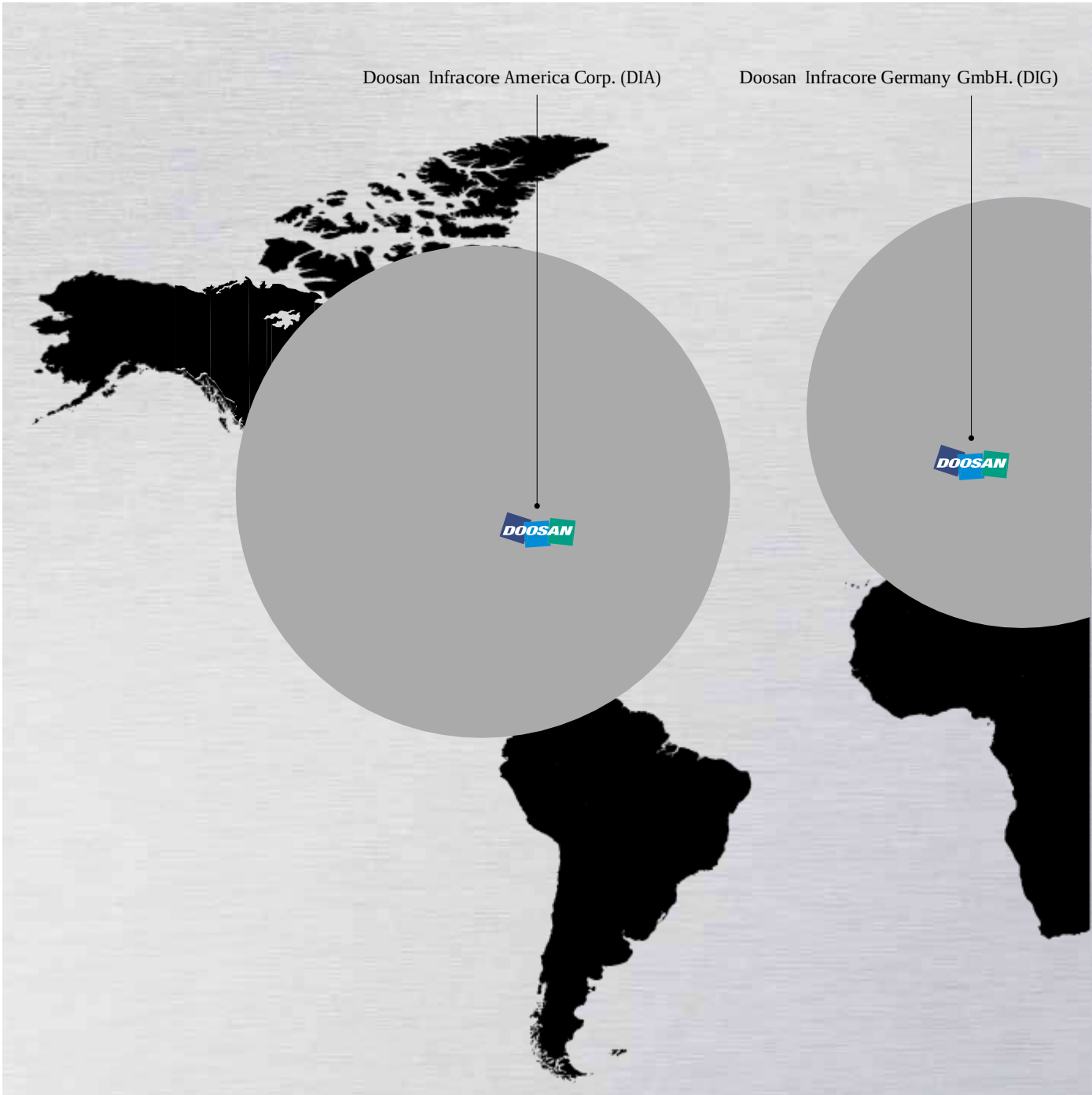
● Standard ○ Optional X N/A

No.	Item		Spec.	S828D
1	Axes Control	Controlled axes	3 axes	X, Y, Z
2			4 axes	○
3			5 axes	○
4		Simultaneously controlled axes	Positioning(G00)/Linear interpolation(G01) : 3 axes Circular interpolation(G02, G03) : 2 axes	●
5			Positioning(G00)/Linear interpolation(G01) : 4 axesCircular interpolation(G02, G03) : 2 axes	○
6		Least command increment	0.001mm (0.0001 inch)	●
7		Least input increment	0.001mm (0.0001 inch)	●
8		Maximum commandable value	±99999.999mm (±3937 inch)	●
9	Interpolation & Feed functions	Reference point return		●
10		Inverse time feedrate	G93	●
11		Spline interpolation (A, B and C splines)		○
12	Spindle Functions	Retraction for rigid tapping		●
13		Rigid tapping		●
14	Tool Functions	**Tool radius compensations in plane**		
15		• With approach and retract strategies		●
16		• With transition circle/ellipse on outer edges		●
17		Number of tools/cutting edges in tool list	256/512	●
18		Tool length compensation		●
19		Tool offset selection via T and D numbers		●
20		Replacement tools for tool management		○
21		Monitoring of tool life and workpiece count		●
22	Programming & Editing functions	Main program call from main program and subroutine		●
23		Subroutine levels and interrupt routines, max.		11/4
24		Number of subroutine passes <= 9999		●
25		Number of levels for skip blocks 1		●
26		Number of levels for skip blocks 8		○
27		Polar coordinates		●
28		**Auxiliary function output**		
29		• Via M word, max. programmable value range: INT 231-1		●
30		• Via H word, max. range: REAL ± 3.4028 ex 38/ INT -231 ... 231-1		●
31		**High-level CNC language with**		
32		• User variables, configurable		●
33		• Read/write system variables		●
34		• Indirect programming		●
35		• Program jumps and branches		●
36		• Arithmetic and trigonometric functions		●
37		• Compare operations and logic combinations		●
38		• Macro techniques		●
39		• Control structures IF-ELSE-ENDIF		●
40		• Control structures WHILE, FOR, REPEAT, LOOP		●
41		• STRING functions		●

● Standard ○ Optional X N/A

No.	Item		Spec.	S828D
42	Programming & Editing functions	**Program functions**		
43		• Dynamic preprocessing memory FIFO		●
44		• Look ahead number of blocks		150
45		• Frame concept		●
46		• Inclined-surface machining with swivel cycle		●
47		Online ISO dialect interpreter		●
48		**Program/workpiece management**		
49		• Parts programs on NCU, max. number		300
50		• Workpieces on NCU, max. number		100
51		• On additional plug-in CF card		●
52		• On USB storage medium (e.g. disk drive, USB stick)		●
53		• On network drive		○
54		Basic frames, max. number		1
55		Settable offsets, max. number		100
56		**Program editor**		
57		• Programming support for cycles program(Program Guide)		●
58		• CNC editor with editing functions: Marking, copying, deleting		●
59		• Programming graphics/free contour input (contour calculator)		●
60		Technology cycles for drilling/milling		●
61		Pocket milling free contour and islands stock removal cycle		●
62		Residual material detection		●
63		Access protection for cycles		●
64		Programming support can be extended, e.g. customer cycles		●
65		2D simulation		●
66		3D simulation, finished part		●
67		Simultaneous recording		●
68	Other Functions (Operation, setting & Display, etc)	**JOG**		
69		• Handwheel selection		●
70		• Switchover: inch/metric		●
71		**Automatic**		
72		• Execution from USB or CF card interface on operator panel front		●
73		• Execution from network drive		○
74		• DRF offset		○
75		• Block search with/without calculation		●
76		**Preset**		
77		• Set actual value		●
78		10.4" color display		●
79		15.0" color display		○
80		Plain text display of user variables		●
81		**Operating software languages**		
82		• Ch_S,Ch_T, En, Fr, Gr, It, Kr, Pt, Sp		●
83		• Additional languages, use of language extensions		●
84		Working area limitation		●
85		Limit switch monitoring		●
86		Software and hardware limit switches		●
87		**Remote Control System (RCS) remote diagnostics**		
88		• RCS Host remote diagnostics function		○
89		• RCS Commander (viewer function)		●
90		Integrated service planner for the monitoring of service intervals		●
91		Automatic measuring cycles		○
92		Easy Extend		●
93		TRANSMIT/cylinder surface transformation		○
94		Contour handwheel		○
95		Integrate screens in SINUMERIK Operate with SINUMERIK Integrate Run MyScreens		○
96		Cross-mode actions (ASUPs and synchronized actions in all operating modes)		○

Responding to Customers Anytime, Anywhere



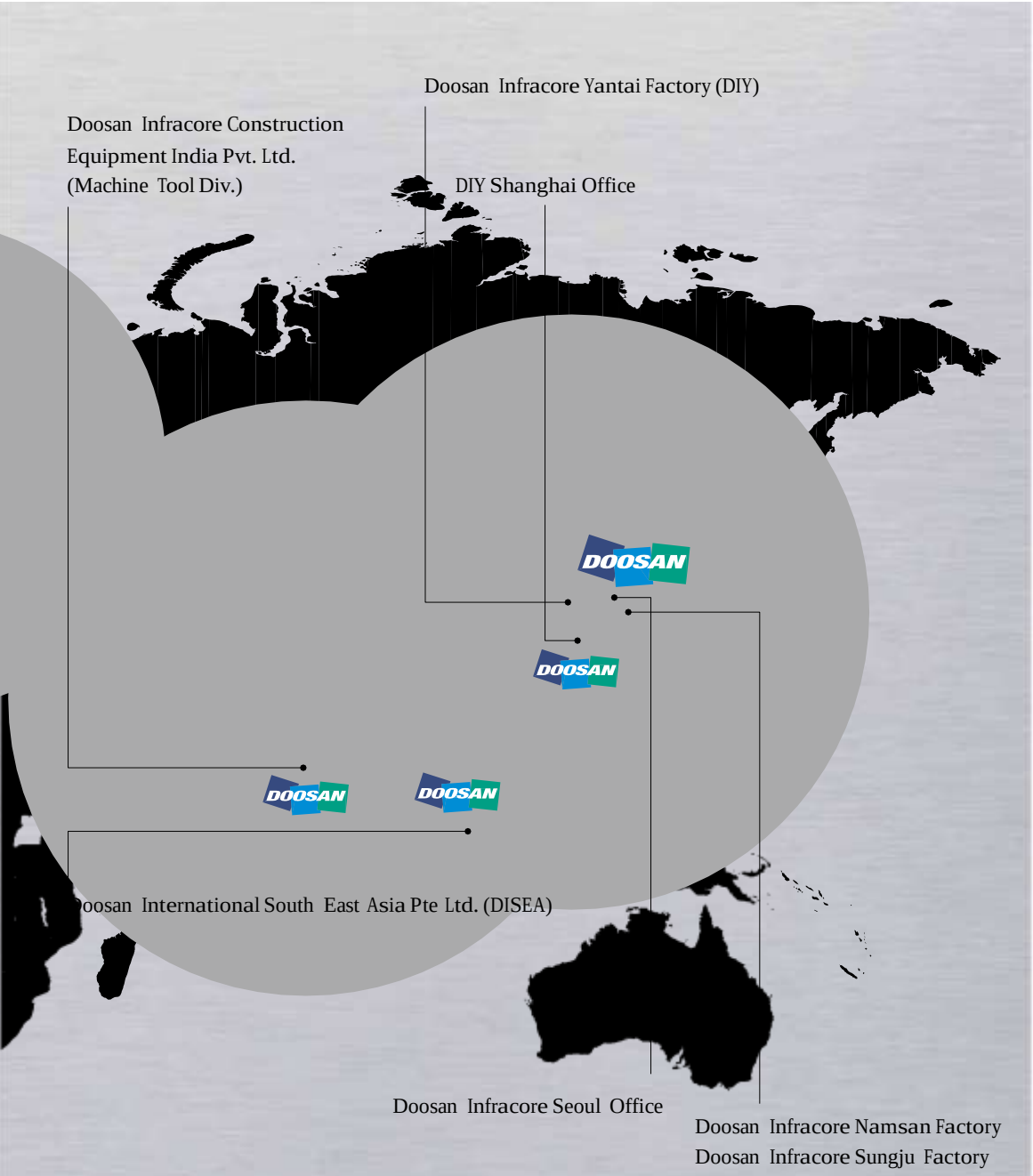
Global Service Support Network

Corporations	Dealer Networks	Technical Centers	Factories
5	128	21	3

Technical Center: Sales Support, Service Support, Parts Support

Doosan Machine Tools' Global Network, Responding to Customer's Needs nearby, Anytime, Anywhere

Doosan machine tools provides a system-based professional support service before and after the machine tool sale by responding quickly and efficiently to customers' demands. By supplying spare parts, product training, field service and technical support, we can provide top class support to our customers around the world.



Domestic Service Support Network

Integrated Support Centers	Sales Branch Offices	Post-Sales Service Centers	Designated Repair Service Centers
2	7	6	31

Customer Support Service

We help customers to achieve success by providing a variety of professional services from pre-sales consultancy to post-sales support.

Supplying Parts

- Supplying a wide range of original Doosan spare parts
- Parts repair service

Field Services

- On site service
- Machine installation and testing
- Scheduled preventive maintenance
- Machine repair

Technical Support

- Supports machining methods and technology
- Responds to technical queries
- Provides technical consultancy

Training

- Programming / machine setup and operation
- Electrical and mechanical maintenance
- Applications engineering

Major Specifications

Mynx series

Description		Unit	Mynx 5400	Mynx 5400/50	Mynx 6500	Mynx 6500/50	Mynx 7500	Mynx 7500/50
Max. spindle speed	Belt	r/min	8000	6000	8000	6000	12000	6000
	Gear		-	-	-	-	-	-
Spindle motor power	Belt 6000	kW (Hp)	-	11/15/15 (14.8/20.1 /20.1)	-	11/15/15 (14.8 /20.1 /20.1)	-	18.5/15 (24.8/ 20.1)
	Belt 8000		15/11 (20.1/14.8)	-	15/11 (20.1/14.8)	-	-	-
	Belt 12000		-	-	-	-	26/22 (34.9/29.5)	-
	Gear 6000		-	-	-	-	-	-
Tool shank		Taper	40	50	40	50	40	50
Travels (X, Y, Z)		mm (inch)	1020/540/530 (40.2/21.3/20.9)		1270/670/625 (50.0/26.4 24.6)		1525/762/625 (60.0/30.0/24.6)	
Number of tools		ea	30	24	30	24	30	24
Table size		mm (inch)	1200 x 540 (47.2 x21.3)		1400 x 670 (55.1 x26.4)		1600 x 750 (63.0 x29.5)	
NC system			DOOSAN FANUC i					

Doosan Machine Tools

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■The specifications and information above-mentioned may be changed without prior notice.